Headquarters
Department of the Army
Washington, DC
1 November 2002

Management

Management of Army Models and Simulations
Army High Level Architecture (HLA) Implementation Procedures

Applicability. This memorandum applies to Headquarters, Department of the Army (HQDA) and its field operating agencies.

Proponent and exception authority. The proponent of this memorandum is the Deputy Under Secretary of the Army for Operations Research (DUSA(OR)). The DUSA(OR) has the authority to approve exceptions to this memorandum that are consistent with controlling law and regulation. The DUSA(OR) may delegate the approval authority, in writing, to a division chief under their supervision within the proponent agency who holds the grade of colonel or the civilian equivalent.

1. Purpose

This memorandum establishes procedures for implementing the high level architecture (HLA) as the standard technical architecture for interoperability among Army simulations. This memorandum also outlines procedures for how the HLA transition will be implemented or how the exclusion determination will be made. Army Regulation (AR) 5-11 establishes HLA as the standard technical architecture with which all Army simulations will be compliant. Under the Department of Defense (DOD) Memorandum of Agreement on HLA for DOD simulations, the Army agrees that, in the future, all Army simulations will have either

transitioned to HLA or will be designated as being excluded from needing to transition based upon requirements, resources, priorities, and/or security.

2. References
Required and related publications and prescribed and referenced forms are listed in appendix A.

3. Explanation of abbreviations and terms
Abbreviations and special terms used in this memorandum are explained in the glossary.

4. Background
a. Simulation reuse and interoperability are among the primary modeling and simulation (M&S) goals for DOD. The efficient and effective use of a standard technical architecture by the Army, along with industry, will reduce the overall cost of simulation development. The HLA is a proven method for exchanging data from one simulation to another. Although the ability to exchange data does not guarantee interoperability, HLA is the standard framework establishing the first step to be used by object federations in creating an environment in which interoperability can be achieved. These reasons form the basis of the Army adopting HLA as a requirement for all new and planned simulations. The same reasons justify transitioning existing simulations, where appropriate.
b. The term "simulations" will be used throughout this memorandum to represent simulations and simulators that are computer-based.

5. Period of performance
These implementation procedures are effective from the date of this memorandum and remain in effect until superceded and/or incorporated into a Department of the Army Pamphlet.

6. Applicability and scope
These implementation procedures apply to all Army computer-based simulations, unless excluded from the HLA requirement as stated in this memorandum. This includes live, virtual, and constructive simulations in all three domains: Advanced Concepts and Requirements (ACR); Research, Development, and Acquisition (RDA); and Training, Exercises, and Military Operations (TEMO).

7. Responsibilities
a. Deputy Under Secretary of the Army (Operations Research) (DUSA(OR)). The DUSA(OR) will-
(1) Approve the Army HLA implementation procedures and any subsequent changes.
(2) Serve as the final HLA exclusion authority for the Army.
(3) Report the Army's HLA compliance status to the DOD Executive Council for Modeling and Simulation (EXCIMS) as required.
b. Director of the Army Model and Simulation Office (AMSO). The Director, AMSO will-
(1) Provide HQDA-level oversight of HLA implementation compliance.
(2) Conduct an annual review of the status of HLA compliance and provide an assessment to the Army Model and Simulation Executive Council (AMSEC).
(3) Ensure that HLA implementation procedures are reviewed annually and modified when necessary.
(4) Recommend to the DUSA(OR) approval/disapproval of HLA exclusion requests.
(5) Adjudicate issues and provide interpretations of these procedures in conjunction with the Requirements Integration Working Group (RIWG) and the Policy and Technology Working Group (P&TWG).
(6) Recommend a simulation proponent to the DUSA(OR) for Army cross-domain simulation that does not already have a simulation proponent designated.
c. Requirements Integration Working Group co-chairs. The RIWG co-chairs, in consultation with the members of the RIWG, will-
(1) Process all HLA exclusion requests and recommend approval/disapproval to the Director, AMSO.

(2) Compile information on HLA compliance status, based upon input from the domain managers (that is, ACR, RDA, and TEMO), and provide it to the Director, AMSO.

(3) Recommend a proponent to the Director, AMSO, in case there is no proponent for a cross-domain simulation.

d. Model and simulation domain managers/agents. Model and simulation domain managers/agents will-

(1) Develop and publish HLA processes for their domain for monitoring compliance efforts and handling exclusion requests.

(2) Process exclusion requests submitted by simulation proponents and make recommendations to the RIWG.

(3) Provide their domain's HLA compliance status information to the RIWG annually or as required.

e. Simulation proponent. The organization designated to be responsible for initiating development and directing control of the reference version of a simulation in accordance with AR 5-11, will-

(1) Ensure that their Army-owned simulations are in compliance with the current Army HLA policy in AR 5-11 unless the DUSA(OR) has granted the simulation an exclusion from being HLA-compliant.

(2) Prepare any necessary HLA exclusion requests and process the exclusion requests in accordance with paragraph 10 of this memorandum.

8. Guidelines

a. The current Army HLA standard is the DOD HLA Technical Specifications, version 1.3.

b. The Army's intent is that all new Army simulations be HLA-compliant unless the DUSA(OR) grants the simulation an exclusion. If an existing simulation is required to inter-operate, stimulate, or exchange data with an HLA-compliant simulation, the existing simulation should also be HLA-compliant.

c. Army simulations will be categorized as follows:

(1) HLA-compliant. Simulations that have successfully completed the HLA compliance-testing process conducted by the Defense Modeling and Simulation Office (DMSO). (NOTE: The compliance testing process has been established as the means to ensure that DOD simulations are, in fact, HLA-compliant. Compliance testing is available through a web-based interface that includes a reference library of documents, on-line help, email, and a test registration process.)

(2) HLA-compliant pending. Simulations that are not yet HLA-compliant but are being developed or modified to be HLA-compliant.

(3) HLA exclusion. Simulations that are exempt from the HLA compliance requirement. HLA exclusion requests will be considered in accordance with procedures in paragraph 10 of this memorandum.

(4) Non-HLA-compliant. Simulations that have not passed the compliance test, have no exclusion, and have no plan to become HLA-compliant.

d. DOD-approved exclusions and waivers. Previously, DOD managed the transition of simulations to become HLA-compliant and granted exclusions and waivers.

(1) Previously approved DOD exclusions.

(a) As part of the DOD HLA management process, exclusions from the HLA requirement were granted for simulations and simulators that were part task trainers (PTT), internal components of larger systems, and simulators used only for production line quality control or diagnostic testing. (See para 11 for more details.)

(b) HLA exclusions granted prior to the Memorandum of Agreement will remain valid and will be recognized by the Army.

(2) Previously approved DOD waivers. Simulations that were previously approved by DOD for a waiver (for example, simulations being replaced by future HLA-compliant simulations) will be evaluated by the RIWG for possible exclusion under this Army guidance and a recommendation forwarded in accordance with paragraph 10. The simulation proponent is not required to submit a request for exclusion. If an exclusion status is not approved by the DUSA(OR), the simulation proponent will be notified, and the simulation will be required to become HLA-compliant.

e. Compliance with HLA, as defined in paragraph 8c of this memorandum, does not mandate the use of

any particular methodology, supporting software implementations, or tools. However, all emerging simulations and simulation upgrades must comply with applicable information technology standards contained in the DOD Joint Technical Architecture.

f. Simulations that are used but not owned by the Army are strongly encouraged to be HLA-compliant to facilitate the simulation reuse and interoperability goals of the DOD. Army organizations will use HLA compliance as one of the significant selection factors in the selection and accreditation of a simulation for use by the Army.

9. HLA compliance procedures

Existing simulations that are transitioning to HLA compliance, or new simulations under development, will use the following Army HLA compliance procedures:

a. A simulation proponent will prepare a plan stating how that simulation will become HLA compliant and submit it to the appropriate domain manager/agent for review and approval.

b. When a simulation is ready for compliance testing, the Army simulation proponent will submit an application for an HLA-compliance test. (For information and forms, see the HLA Web page on the DMSO Web site at http://www.dmso.mil/.)

c. When a simulation passes the HLA compliance test, DMSO will send a Certificate of Compliance to AMSO and to the simulation proponent. The Director, AMSO will ensure that the database is updated and posted on the AMSO HLA Web page.

d. For a simulation receiving a Certificate of Compliance, the simulation proponent will send a memorandum with test results to the appropriate domain manager/agent who will forward the memorandum to the RIWG co-chairs.

10. Exclusion request procedures

a. The simulation proponent provides a written request for exclusion to the appropriate domain manager/agent for review and reconciliation.

(1) ACR domain. Forward requests to Commander, U.S. Army Training and Doctrine Command, ATTN: DCS-CD, Fort Monroe, VA 23651-5389.

(2) RDA domain. Forward requests to HQDA, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), ATTN: SAAL-ZS, Room 2E673, Army Pentagon, Washington, DC 20310.

(3) TEMO domain. Forward requests to Commander, U.S. Army Training and Doctrine Command, Deputy Chief of Staff for Training, ATTN: ATTG-ZA, Fort Monroe, VA 23651-5000.

b. The request for exclusion will include the simulation name, simulation acronym, description of simulation functionality, justification for the exclusion and impact on simulation interoperability and reuse. (See para 11 for information on exclusion criteria.)

c. The domain manager/agent will review the HLA exclusion request and obtain any necessary clarification prior to forwarding the HLA exclusion request, with their recommendation, to the RIWG.

d. The RIWG considers the exclusion request, any clarification, and the manager/agent recommendation, and recommends approval/disapproval to the Director, AMSO.

e. The Director, AMSO recommends to the DUSA(OR) approval/disapproval of the HLA-exclusion request.

f. When the DUSA(OR) has informed the Director, AMSO of the exclusion request decision, the Director, AMSO will provide a memorandum to the requesting simulation proponent via the appropriate domain manager, documenting the resolution of the request. A copy of the memorandum will be forwarded to the RIWG co-chairs.

11. HLA simulation exclusion criteria

The Army HLA-exclusion criteria for HLA compliance includes, but is not limited to, simulations that fall

into the following three categories. These categories are in accordance with High Level Architecture Transition Report submitted by Architecture Management Group of the EXCIMS, March 1998:

a. Internal components of a simulation. Internal components of a simulation do not need to be HLA-compliant, even if used in a distributed manner. A simulation must be HLA-compliant to inter-operate with other simulations and live systems but not with itself. Note that there may be opportunities to use the HLA internal to simulations, but this is not required as a matter of policy.

b. Part task trainers. PTTs are training devices having both of the following characteristics:

(1) Used to train humans in some portion of the tasks they are expected to perform in their occupational specialty of system operator or maintainer (for example, pilot, gunner, communicator) but do not provide a complete enough representation of a system's functions, or the ability to interact with other persons normally present in the same crew compartment, as would be necessary to allow the trainees to simulate employment of the system in one or more of its primary missions.

(2) Do not require input from, or output to, other systems (for example, other organizations/units, weapon systems, sensors, command and control systems) to accomplish the training (for example, certain emergency procedure trainers, instrument flying trainers, target/threat identification trainers). Some PTTs may benefit from HLA use, but they are not required to comply as a matter of policy.

c. Stimulators used only for production line quality control or diagnostic testing. These stimulators are used only to test subsystems or some portion of the internal interfaces of a system. They do not provide a complete enough representation of functions as to allow them to simulate employment of the system in one or more of its primary uses (for example, launcher interface stimulators, missile echo units, weapon control system interface stimulators).

12. Points of contact

For the current AMSEC, RIWG, and P&TWG memberships, and the Army domain managers/agents points of contact, please visit the AMSO Web site at http://www.amso.army.mil.

Appendix A
References

Section I
Required Publications

AR 5–11
Management of Army Models and Simulations (Cited in paras 1 and 7e.)

Section II
Related Publications
A related publication is a source of additional information. The user does not have to read it to understand these implementation procedures.

DOD Directive 5000.59
DOD Modeling and Simulation (M&S) Management http://www.dtic.mil/whs/directives

DOD Directive 5000.59–M
DOD Modeling and Simulation (M&S) Glossary http://www.dtic.mil/whs/directives

DOD Directive 5000.59–P
DOD Modeling and Simulation (M&S) Master Plan (MSMP) http://www.dtic.mil/whs/directives

DOD Memorandum of Agreement (MOA
High Level Architecture (HLA) for Simulation Memorandum of Agreement (MOA), 3 November 2000 https://www.dmso.mil/public/library/projects/hla/moa/HLA_MoA_11_3_00.pdf

High Level Architecture Transition Report
High Level Architecture (HLA) Transition Report, submitted by Architecture Management Group Executive Council for M&S (EXCIMS), March 1998. https://www.dmso.mil/public/library/projects/hla/transition/rept611.pdf

DOD Joint Technical Architecture
DOD Joint Technical Architecture Version 3.1, 31 March 2000 http://www-jta.itsi.disa.mil/jta/jtav3-1/jta31e.pdf

Section III
Prescribed Forms
This section contains no entries.

Section IV
Referenced Forms
This section contains no entries.

Glossary

Section I
Abbreviations

ACR
Advanced Concepts and Requirements

AMSEC
Army Model and Simulation Executive Council

AMSO
Army Model and Simulation Office

AR
Army regulation

DMSO
Defense Modeling and Simulation Office

DOD
Department of Defense

DODD
Department of Defense Directive

DUSA(OR)
Deputy Under Secretary of the Army (Operations Research)

EXCIMS
Executive Council for Modeling and Simulation

HLA
high level architecture

HQDA
Headquarters, Department of the Army

M&S
modeling and simulation

P&TWG
Policy and Technology Working Group

PTT
part task trainers

RDA
Research, Development, and Acquisition

RIWG
Requirements Integration Working Group

TEMO
training exercises and military operations

Section II
Terms

Below is a short list of terms that are pertinent to Army HLA. The DODD 5000.59-M contains the complete list of M&S terms. For the definitions of the Army HLA categories refer to paragraph 8c of this memorandum.

Model
A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

Model Types

a. Physical model. A physical representation of the real world object as it relates to symbolic models in the form of simulators.

b. Mathematical model. A series of mathematical equations or relationships that can be discretely solved. This includes models and simulations using techniques of numerical approximation to solve complex mathematical functions for which specific values cannot be derived (for example, integrals).

c. Procedural model. An expression of dynamic relationships of a situation expressed by mathematical and logical processes. These models are commonly referred to as simulations.

Modeling and Simulation (M&S)
The development and use of live, virtual, and constructive models including simulators, stimulators, emulators, and prototypes to investigate, understand, or provide experiential stimulus to either (1) conceptual systems that do not exist or (2) real life systems that cannot accept experimentation or observation because of resource, range, security, or safety limitations. This investigation and understanding in a synthetic environment will support decisions in the domain's RDA and ACR, or transfer necessary experiential effects in the TEMO domain.

Simulation
A method for implementing a model(s) over time.

Simulator
A device, computer program, or system that performs simulation. For training, a simulator is a device that duplicates the essential features of a task situation and provides for direct practice.

Stimulator

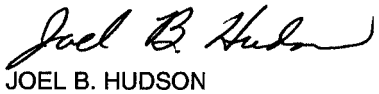
a. A hardware device that injects or radiates signals into the sensor system(s) of operational equipment to imitate the effects of platforms, munitions, and environment that are not physically present.

b. A battlefield entity consisting of hardware and/or software modules that inject signals directly into the sensor systems of an actual battlefield entity to simulate other battlefield entities in the virtual battlefield.

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army

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